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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Integral Consulting Inc.
Suite 190
285 Century Place
Louisville CO 80027

Report Date: May 22, 2017

Project: Solvay

Submittal Date: 04/28/2017
Group Number: 1794965
State of Sample Origin: NJ

Client Sample Description	Lancaster Labs (LL) #
V-915 Grab Water	8965068
Field Blank Grab Water	8965069

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	Solvay	Attn: Mitch Gertz
Electronic Copy To	Solvay	Attn: Mark Christensen
Electronic Copy To	Integral Consulting Inc.	Attn: Erin Palko
Electronic Copy To	Integral Consulting Inc.	Attn: Craig Hutchings

Respectfully Submitted,

Stacy L. Hess
Project Manager

(717) 556-7236

Sample Description: V-915 Grab Water
Solvay

LL Sample # WW 8965068
LL Group # 1794965
Account # 20003

Project Name: Solvay

Collected: 04/26/2017 09:00 by C

Submitted: 04/28/2017 09:45
Reported: 05/22/2017 21:29

Integral Consulting Inc.
Suite 190
285 Century Place
Louisville CO 80027

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	280	B	0.6	2	1
10954	Perfluorononanoic acid	375-95-1	2,000		6	20	10
10954	Perfluorodecanoic acid	335-76-2	15		0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	59		1	3	1
10954	Perfluorododecanoic acid	307-55-1	N.D.		0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.9	J	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	17		0.6	2	1
10954	Perfluoroheptanoic acid	375-85-9	30		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.		0.8	3	1
10954	Perfluorohexanesulfonate	355-46-4	1	J	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	3	J	2	6	1

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

PFOA was detected in the method blank associated with this sample. Since the result in the sample was greater than 10 times the result in the method blank, the data is reported.

The injection internal standard peak areas were outside of the QC limits for both the initial injection and the re-injection. The values here are from the initial injection of the sample.

Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFAS in Water by LC/MS/MS	EPA 537 Rev. 1.1 modified	1	17125003	05/18/2017 01:38	Jason W Knight	1
10954	PFAS in Water by LC/MS/MS	EPA 537 Rev. 1.1 modified	1	17125003	05/18/2017 12:36	Devon M Whooley	10
14091	PFAS Water Prep	EPA 537 Rev. 1.1 modified	1	17125003	05/05/2017 08:35	Pamela Rothharpt	1

*=This limit was used in the evaluation of the final result

Sample Description: Field Blank Grab Water
Solvay

LL Sample # WW 8965069
LL Group # 1794965
Account # 20003

Project Name: Solvay

Collected: 04/26/2017 09:00 by C

Submitted: 04/28/2017 09:45
Reported: 05/22/2017 21:29

Integral Consulting Inc.
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CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	0.8	JB	0.6	2	1
10954	Perfluorononanoic acid	375-95-1	N.D.		0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	N.D.		0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.		1	3	1
10954	Perfluorododecanoic acid	307-55-1	N.D.		0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	N.D.		0.6	2	1
10954	Perfluoroheptanoic acid	375-85-9	N.D.		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.		0.8	3	1
10954	Perfluorohexanesulfonate	355-46-4	N.D.		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.		2	6	1

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

PFOA was detected in the method blank associated with this sample.

Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFAS in Water by LC/MS/MS	EPA 537 Rev. 1.1 modified	1	17125003	05/18/2017 01:59	Jason W Knight	1
14091	PFAS Water Prep	EPA 537 Rev. 1.1 modified	1	17125003	05/05/2017 08:35	Pamela Rothharpt	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Integral Consulting Inc. Group Number: 1794965
Reported: 05/22/2017 21:29

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result		MDL**	LOQ
	ng/l		ng/l	ng/l
Batch number: 17125003	Sample number(s): 8965068-8965069			
Perfluorooctanoic acid	2	J	0.6	2
Perfluorononanoic acid	N.D.		0.6	2
Perfluorodecanoic acid	N.D.		0.5	2
Perfluoroundecanoic acid	N.D.		1	3
Perfluorododecanoic acid	N.D.		0.5	2
Perfluorotridecanoic acid	N.D.		0.5	2
Perfluorotetradecanoic acid	N.D.		0.5	2
Perfluorohexanoic acid	N.D.		0.6	2
Perfluoroheptanoic acid	N.D.		0.5	2
Perfluorobutanesulfonate	N.D.		0.8	3
Perfluorohexanesulfonate	N.D.		1	3
Perfluoro-octanesulfonate	N.D.		2	6

LCS/LCSD

Analysis Name	LCS Spike Added ng/l	LCS Conc ng/l	LCSD Spike Added ng/l	LCSD Conc ng/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 17125003	Sample number(s): 8965068-8965069								
Perfluorooctanoic acid	200	153.03	200	147.26	77	74	70-130	4	30
Perfluorononanoic acid	200	155.86	200	147.47	78	74	70-130	6	30
Perfluorodecanoic acid	200	179.79	200	174.15	90	87	70-130	3	30
Perfluoroundecanoic acid	200	160.68	200	159.4	80	80	70-130	1	30
Perfluorododecanoic acid	200	156.34	200	157.13	78	79	70-130	1	30
Perfluorotridecanoic acid	200	165.88	200	149.97	83	75	70-130	10	30
Perfluorotetradecanoic acid	200	168.65	200	160.57	84	80	70-130	5	30
Perfluorohexanoic acid	200	161.5	200	152.23	81	76	70-130	6	30
Perfluoroheptanoic acid	200	169.36	200	160.81	85	80	70-130	5	30
Perfluorobutanesulfonate	176.8	135.23	176.8	130.99	76	74	70-130	3	30
Perfluorohexanesulfonate	189.2	153.7	189.2	146.17	81	77	70-130	5	30
Perfluoro-octanesulfonate	191.2	140.19	191.2	138.81	73	73	70-130	1	30

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Integral Consulting Inc. Group Number: 1794965
Reported: 05/22/2017 21:29

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ng/l	MS Spike Added ng/l	MS Conc ng/l	MSD Spike Added ng/l	MSD Conc ng/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 17125003	Sample number(s): 8965068-8965069 UNSPK: 8965068									
Perfluorooctanoic acid	284.5	199.82	444.1			80		70-130		
Perfluorononanoic acid	1989.97	199.82	2226.57			118 (2)		70-130		
Perfluorodecanoic acid	15.34	199.82	195.41			90		70-130		
Perfluoroundecanoic acid	58.64	199.82	213.54			78		70-130		
Perfluorododecanoic acid	N.D.	199.82	153.46			77		70-130		
Perfluorotridecanoic acid	0.865	199.82	171.11			85		70-130		
Perfluorotetradecanoic acid	N.D.	199.82	180.79			90		70-130		
Perfluorohexanoic acid	17.45	199.82	196.85			90		70-130		
Perfluoroheptanoic acid	30.49	199.82	200.76			85		70-130		
Perfluorobutanesulfonate	N.D.	176.64	155.98			88		70-130		
Perfluorohexanesulfonate	1.18	189.03	162.64			85		70-130		
Perfluoro-octanesulfonate	2.99	191.03	191.64			99		70-130		

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: PFAS in Water by LC/MS/MS
Batch number: 17125003

	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA	13C8-PFOA	13C8-PFOS
8965068	161*	63*	92	79	72	83
8965069	85	87	86	96	91	79
Blank	73	70	63*	71	75	66*
LCS	78	71	67*	74	70	82
LCSD	80	80	70	73	73	79
MS	152*	69*	90	75	78	68*
Limits:	70-130	70-130	70-130	70-130	70-130	70-130

	13C9-PFNA	13C6-PFDA	13C7-PFUnDA	13C2-PFDoDA	13C2-PFTeDA
8965068	66*	75	59*	63*	62*
8965069	77	66*	91	89	72
Blank	66*	67*	56*	68*	66*
LCS	77	76	79	89	83
LCSD	88	73	68*	77	71
MS	69*	67*	66*	73	70
Limits:	70-130	70-130	70-130	70-130	70-130

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only
Acct. # 6663 Group # 1794965 Sample # 8465068-69

COC # 526904

For Lab Use Only
FSC:
SCR#: 205164

Client Information		Matrix	Total # of Containers	Analysis Requested
Client: Solvay	Acct. #:			Preservation Codes: O
Project Name/#:	PWSID #:			PFAA by LC/MS/MS
Project Manager: Gertz	P.O. #:			
Sampler: Christensen	Quote #:			
State where samples were collected: NJ	For Compliance: Yes ☒ No ☐			

Matrix: Tissue ☐; Sediment ☐; Soil ☐; Water: Ground ☐, Surface ☐, Potable ☐, NPDES ☒; Other:

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Water	Other	Total # of Containers	PFAA by LC/MS/MS
V-915	4/26/17	0900	X					2	X
Field Blank	4/26/17	0900	X					1	X

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks
O = Trizma

Turnaround Time (TAT) Requested (please circle)
(Standard) Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: 5/25/17

E-mail address:

Relinquished by	Date	Time	Received by	Date	Time
[signature]	4-21-17	1305	[signature]	4/24/17	1500
[signature]	4/27/17	1500			
			[signature]	4/28/17	0945

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)
Type III (Reduced non-CLP) NJ DKQP TX TRRP-13
NYSDEC Category A or B MA MCP CT RCP

EDD Required? Yes (No)
If yes, format:

Site-Specific QC (MS/MSD/Dup)? Yes (No)
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS FedEx X Other

Temperature upon receipt 1.5 °C

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Sample Administration Receipt Documentation Log

Doc Log ID: 182134

Group Number(s): 1794965

Client: Solvay

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	04/28/2017 9:45
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	NJ		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	N/A
Samples Chilled:	Yes	Total Trip Blank Qty:	0
Paperwork Enclosed:	Yes	Air Quality Samples Present:	No
Samples Intact:	Yes		
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Karen Diem (3060) at 15:14 on 04/28/2017

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT121	1.5	DT	Wet	Y	Bagged	N

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Lancaster, PA 17605-2425
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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	milliliter(s)
cfu	colony forming units	**MPN**	Most Probable Number
CP Units	cobalt-chloroplatinate units	**N.D.**	none detected
F	degrees Fahrenheit	**ng**	nanogram(s)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…
W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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